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July 25, 2008

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Mr. Allen Gaither
Environmental Engineer
North Carolina Department of Environment and Natural Resources
Division of Waste Management, Solid Waste Section
2090 US Highway 70
Swannanoa, North Carolina 28778

RECEIVED
JUL 29 2008
SOLID WASTE SECTION
ASHEVILLE REGIONAL OFFICE

Subject: Revised Methane Monitoring and Response Plan
Jackson County Closed Landfill - Permit # 50-02
Jackson County, North Carolina

Dear Mr. Gaither:

The alternative proposed in your June 16, 2008 letter is acceptable to Jackson County. As requested, please find attached a copy of the revised Methane Monitoring and Response Plan.

If you would like additional information, please do not hesitate to contact me at (828) 281-3350 extension 21.

Sincerely,

Christopher F. Gilbert, P.E.

Attachments: Methane Monitoring and Response Plan

cc: Mr. Chad Parker – Director, Jackson County Solid Waste Department

P:\Jackson County\Dillsboro LFG\Correspondence\Ltr-DENR-Gaither-methane_monitoring_plan.doc

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METHANE MONITORING AND RESPONSE PLAN

JACKSON COUNTY MAINTENANCE BUILDING
DILLSBORO, NORTH CAROLINA

Prepared for
Jackson County

Revision 0: January 13, 2003
Revision 1: May 2, 2003
Revision 2: July 10, 2008

Prepared by
Altamont Environmental, Inc.
50 College Street
Asheville, NC 28801
(828) 281-3350

Christopher F. Gilbert, P.E.
Project Manager

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SIGNATURE PAGE

I, the undersigned, have read, been oriented on, and understand the information contained in this document and agree to comply with the provisions for response to elevated methane levels as specified herein.

NAME	SIGNATURE	DATE

1.0 INTRODUCTION

There has been periodic migration of landfill gas (LFG) from the closed Jackson County Municipal Solid Waste Landfill in Dillsboro to subsurface soils near the Jackson County Maintenance Building. LFG can accumulate in enclosed structures until it reaches explosive concentrations, at which time an ignition source (e.g., flame, cigarette, electric heater, etc.) can trigger an explosion. Therefore, to ensure protection of workers and property in the Jackson County Maintenance Building, a LFG monitoring program has been implemented.

This document has been prepared by Altamont Environmental, Inc., (Altamont) on behalf of Jackson County, to provide County workers in the Maintenance Building with a concise, readily available source of information about LFG, the methane monitoring program, and actions to take in the event of methane detection. All workers using the Maintenance Building must read and be oriented on the contents of this document and acknowledge such by completing the signature page. A copy of this document shall be kept on file at the front desk for easy reference.

LFG is generated within landfills by natural biological degradation processes. LFG is typically comprised of about 55 percent methane and 45 percent carbon dioxide. Carbon dioxide is a non-hazardous gas present in the atmosphere. Methane is a colorless, odorless, non-toxic gas that can be explosive if it accumulates in a confined space at concentrations between five and 15 percent. Five percent methane is the lower explosive limit (LEL) – the lowest concentration of methane that is explosive. Fifteen percent methane is the upper explosive limit (UEL) – the highest concentration of methane that is explosive. While concentrations of methane greater than 15 percent are not explosive, high concentrations of LFG will displace air and can cause an oxygen-deficient atmosphere.

The original Methane Monitoring and Response Plan included the use of two permanently installed wall mounted automatic methane alarms in the County Maintenance Building. These alarms provided continuous monitoring for methane. Since the implementation of the Methane Monitoring and Response Plan in January 2003 and the installation of the landfill gas extraction system in February 2006, the following have been observed:

- A continued decrease in the measured concentrations of methane in gas probes,
- No measurable methane concentrations within the County Maintenance Building using an Organic Vapor Analyzer with a Flame Ionization Detector, and
- No reported triggering of the automatic methane alarms.

Based upon these observations it was recommended that the continuous monitoring for methane in the County Maintenance Building with automatic alarms be discontinued. A written request to discontinue the use of the automatic alarms and modify the current Methane Monitoring and Response Plan was submitted to the North Carolina Department of Environment and Natural Resources (DENR), Division of Waste Management, Solid Waste Section on March 31, 2008.

On June 16, 2008 the DENR replied to the letter requesting the modification of the current Methane Monitoring and Response Plan. In the reply letter a monitoring plan for the next twelve months was approved. This monitoring program consists of three components:

1) Quarterly monitoring of methane concentrations in a network of subsurface monitoring points (gas probes) around the landfill and County Maintenance Building;
2) Bi-weekly screening within the County Maintenance Building with a very sensitive instrument that will detect low concentrations of methane, if present; and
3) If measurable methane concentrations are detected during bi-weekly screening within the County Maintenance Building, reinstate the continuous monitoring for methane in the County Maintenance Building with automatic strobe and audible alarms.

Once the new alternative methane monitoring is initiated, if there have been no monitored methane concentrations above the LEL for three consecutive months, monthly monitoring may be requested within the County Maintenance Building. If monitored methane concentrations do not exceed the LEL during the monthly monitoring within the County Maintenance Building for 12 consecutive months, then the county may request quarterly monitoring.

2.0 PROGRAM IMPLEMENTATION

The methane monitoring program is being implemented by Jackson County and Altamont, with responsibilities as follows:

- Altamont has primary responsibility for conducting quarterly monitoring of subsurface monitoring points. Landfill gas concentrations will be recorded, incorporated into the operating record for the landfill, and maintained by Altamont within a database.

- Altamont will perform the quarterly screening of structures near the landfill for methane using an intrinsically safe flame-ionization detector (FID). The FID can detect methane at a concentration of approximately one part per million. Locations and concentrations of methane detections will be documented and included in the operating record for the landfill. If concentrations of methane in the building exceed one percent, Altamont will advise the County to take specific appropriate actions.

- The Jackson County Solid Waste Director has the responsibility for performing bi-weekly then, if suitable, monthly screening within the County Maintenance Building with a very sensitive instrument that will detect low concentrations of methane. Locations and concentrations of methane detections will be documented and included in the operating record for the landfill. On weeks/months that Altamont performs screening duties the Jackson County Solid Waste Manager will not be required to perform duplicate screening.

3.0 METHANE DETECTION PROCEDURES

The methane screening will warn the County Maintenance Building occupants of elevated methane concentrations before explosive conditions develop. If methane is detected at elevated concentrations in the building the highest level supervisor present is responsible for implementing the response procedure described in this section.

During methane screening events if methane is detected at a concentration between ten percent (0.5 percent methane) and twenty percent of the LEL all occupants of the building should be alerted. The methane screening will be conducted daily until the automatic methane monitors can be recalibrated and activated. If methane is detected at a concentration greater than twenty percent (1 percent methane) of the LEL, the following steps should be taken immediately:

1) Open all exterior doors to provide additional ventilation.

2) Eliminate all potential sources of ignition. Turn off engines, lights, heaters, etc., and refrain from smoking.

3) Notify the Sylva Fire Department by dialing 586-2000 or 911. Provide the location (Jackson County Maintenance Building, 1148 Haywood Road, Dillsboro, North Carolina) and inform them that elevated levels of methane have been detected in the building.

4) While waiting for the fire department, continuously check the percent LEL digital readout on the monitoring equipment and respond as described below:

    - If the percent LEL is greater than 25, evacuate the premises by walking up to the covered area adjacent to the Green Energy Park Building and wait there until the fire department has arrived and cleared the building for reentry.

    - If the percent LEL is less than 25, continue to monitor until the percent LEL either exceeds 25 or drops back down below 20. If it exceeds 25, then evacuate as described above. If it drops below 20, perform periodic checks of the percent LEL until it drops below 10.

5) During regular business hours make the following telephone notifications:

    - Chad Parker, Jackson County Solid Waste Director, 586-7577; or Ken Westmoreland, County Manager, 631-2295.

    - Chris Gilbert, Altamont Environmental, Inc. (828) 281-3350, ext. 21.

6) Document the elevated methane levels, highest observed percent LEL reading, and response procedures implemented.